VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a major, municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260 et seq. The discharge results from the operation of a publicly owned municipal wastewater treatment plant. This permit action consists of updating the permit to reflect changes in Water Quality Standards and agency policies and procedures.

SIC Code: 4952 – Sewerage Systems.

1. Facility Name and Address: Henrico County Water Reclamation Facility (WRF)
   9101 WRVA Road
   Henrico, Virginia 23231

2. Permit No.: VA0063690
   Permit Expiration Date: May 31, 2017

3. Owner: County of Henrico
   Contact Name: James Grandstaff
   Title: Division Director, Water Reclamation Facility
   Telephone No.: 804-795-9302
   Address: 9101 WRVA Road
   Henrico, Virginia 23231

4. Application Complete Date: 04/07/2017
   Permit Drafted By: Joseph Bryan Date: 03/28/2017
   DEQ Regional Office: Piedmont Regional Office

   Reviewed By: Morgan McHugh Date: 03/29/2017
   Emilee Adamson Date: 04/10/2017
   Kyle Ivar Winter Date: 03/30/2017

5. Receiving Stream:
   Name: James River
   River Mile: 2-JMS094.58
   Basin: James River Basin
   Subbasin: James River Basin (Lower)
   Section: 1
   Class: II
   Special Standards: None
   Tidal Flow? Yes – Flow frequencies cannot be determined
   On 303(d) list? Yes – See Section 13

   See Flow Frequency Analysis (**Attachment 1**)

6. **Operator License Requirements** (18 VAC 160-20-130.D and 9 VAC 25-31-200.C): The recommended attendance hours by a licensed operator and the minimum daily hours that the treatment works should be manned by operating staff are contained in the Sewage Collection and Treatment Regulations (SCAT) 9 VAC 25-790 et seq. A **Class 1** licensed operator is required for the facility.

7. **Reliability Class** (9 VAC 25-790-70): Reliability is a measurement of the ability of a component or system to perform its designated function without failure or interruption of service. The reliability classification is based on the water quality and public health consequences of a component or system failure. The permittee is required to maintain **Class I Reliability** for the existing facility.

8. **Permit Characterization**:

(X) Existing Discharge	(X) POTW - Municipal	(X) Discharge to 303(d) Listed Segment
(X) Effluent Limited	(X) Water Quality Limited	(X) Whole Effluent Toxicity (WET) Program Required (2.0 MGD only)

9. **Wastewater Flow and Treatment**:

Discharge Description.

Outfall Number	Wastewater Source	Treatment	Flow
001	Residential, commercial and industrial wastewater from the counties of Henrico, Hanover, and Goochland. Approximately 20 significant industrial users.	Wastewater: Screening (bar rack), grit removal, primary clarification, activated sludge, Enhanced Biological Nutrient Removal (ENR), secondary clarification, filtration, and chlorination/dechlorination. Sludge: Anaerobic digestion, gravity belt thickening, centrifuge dewatering.	75.0 MGD design capacity

See **Attachment 2** for a facility diagram.

10. **Sludge Disposal**: Henrico County currently contracts Nutri-Blend, Inc. to land apply sludge generated by the facility (Pollutant Concentration (PC) Sewage Sludge). The sludge meets Class B pathogen reduction. Nutri-Blend, Inc. also disposes of sludge in a landfill when land application is not available. Biosolids limitations and monitoring requirements and management and reporting requirements are addressed in Part III.A and B of the Permit.

11. **Discharge Location Description**: Topographic Map: Dutch Gap – 099A

    Latitude North: 37˚22'42" Longitude West: 77˚20'50"

    See **Attachment 2** for Site Location Maps.

12. **Material Storage**: The POTW employs and stores a variety of chemicals in the treatment process. Some regularly utilized and stored chemicals include sodium hydroxide, various polymers, aluminum sulfate, sodium hypochlorite, and sodium bisulfite. These chemicals are stored in buildings with appropriate spill containment. See **Attachment 2** for a comprehensive list of chemicals stored on site. The dewatered, digested sludge is stored on a concrete pad. The covered portion of the storage pad allows for approximately 60-days of dry storage. Runoff from portions of the concrete pad not under roof is routed into the excess flow basins.

13. **Ambient Water Quality Information**: Senior planning staff recommended the use of ambient water quality data from monitoring station 2-JMS094.96 located on the James River near Buoy 150, approximately 0.4 miles upstream of the outfall (**Attachment 1**). Hardness data is not available from this station; therefore, hardness data from 2-JMS099.30, approximately 4.7 miles upstream of the outfall at Buoy 157, was used.

    303(d) Listed Segments (TMDL):

    During the 2014 305(b)/303(d) Integrated Water Quality Assessment Report, the James River was considered a Category 5D water ("The Water Quality Standard is not attained where TMDLs for a pollutant(s) have been developed but one or more pollutants are still causing impairment requiring additional TMDL development.") The applicable fact sheets are attached (**Attachment 1**). The Recreation Use is impaired due to *E. coli*. The Aquatic Life Use is impaired due to inadequate submerged aquatic vegetation (SAV), altered benthic community, and elevated chlorophyll a. The Fish Consumption Use is impaired due to a VDH Fish Consumption Advisory for PCBs and due to water column PCB exceedances; in addition, kepone as well as arsenic and mercury are considered non-impairing observed effects due to a VDH advisory and a fish tissue screening value exceedance in largemouth bass, respectively. The Public Water Supply Use is impaired due to PCB water column exceedances. The Wildlife Use is considered fully supporting.

    PCBs, kepone, arsenic, and mercury were all reported as less than the quantification level (QL) on the Water Quality Criteria Monitoring form provided with the application. Thus, there is no reasonable potential for the effluent to cause or contribute to the impairments or observed effects associated with these parameters.

The Henrico WRF was addressed in the bacterial TMDL for the James River and Tributaries – City of Richmond, which was approved by the EPA on 11/4/2010 and by the SWCB on 6/29/2012. The discharge received an annual *E. coli* wasteload allocation of 1.31E+14 cfu/year based on a design flow of 75.0 MGD. Compliance with the *E. coli* permit limitation of 126 n/100 mL (@75.0 MGD =1.31E+14 cfu/yr) will demonstrate compliance with the bacterial TMDL.

In the James River Basin section of the Virginia Water Quality Management Planning Regulation (9 VAC 25-720-60 B), the facility received the following seasonal wasteload allocations for $cBOD_5$ and ammonia as listed in Table B7 - Richmond Crater Interim Water Quality Management Plan (1988):

	$cBOD_5$ (lbs/day)	Ammonia (lbs/day)
Summer (June – October)	3002	2403
Winter (November – May)	4756	3504

These wasteload allocations are included in Part I.A.1 of the permit along with associated concentrations based on the design flow of the facility of 75.0 MGD. Additionally, the plan establishes a minimum dissolved oxygen concentration of 5.6 mg/L. Compliance with TSS, $cBOD_5$, and DO limitations in the permit will demonstrate compliance with the Richmond Crater Water Quality Management Plan.

This facility discharges directly to the James River in the Chesapeake Bay watershed in the upper tidal freshwater James River estuary (segment JMSTF2). The receiving stream has been addressed in the Chesapeake Bay TMDL, approved by EPA on December 29, 2010. The TMDL addresses dissolved oxygen (DO), chlorophyll a, and submerged aquatic vegetation (SAV) impairments in the main stem Chesapeake Bay and its tidal tributaries by establishing non-point source load allocations (LAs) and point-source waste load allocations (WLAs) for Total Nitrogen (TN), Total Phosphorus (TP) and Total Suspended Solids (TSS) to meet applicable Virginia Water Quality Standards contained in 9 VAC 25-260-185 and 9 VAC 25-260-310. This facility is considered a Significant Chesapeake Bay wastewater discharge. All Significant Chesapeake Bay wastewater discharges in the upper tidal freshwater James River estuary (segment JMSTF2) have been assigned aggregate WLAs of 4,454,769.63 pounds per year TN, 370,167.48 pounds per year TP, and 45,474,581.82 pounds per year TSS.

Implementation of the Chesapeake Bay TDML is currently accomplished in accordance with the Commonwealth of Virginia's Phase I Watershed Implementation Plan (WIP), approved by EPA on December 29, 2010, as well as Virginia's Phase II WIP which was submitted to EPA on March 20, 2012. The approved WIPs recognize that the TMDL nutrient WLAs for Significant Chesapeake Bay wastewater dischargers are set in two regulations: 1) the Water Quality Management Planning Regulation (9 VAC 25-720); and 2) the "General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed of Virginia" (9 VAC 25-820). The WIPs further outline that since TSS discharges from wastewater facilities represent an insignificant portion of the Bay's total sediment load, they may be considered in the aggregate. The WIPs also state that wastewater discharges with technology-based TSS limits are considered consistent with the TMDL.

40 CFR 122.44(d)(1)(vii)(B) requires permits to be written with effluent limits necessary to meet water quality standards and to be consistent with the assumptions and requirements of applicable WLAs. DEQ has provided coverage under the VPDES Nutrient General Permit (GP) for this facility under permit VAN040081. The requirements of the Nutrient GP currently in effect for this facility are consistent with the Chesapeake Bay TMDL. This individual permit includes technology-based TSS limits of 8.0 mg/L that are also consistent with the Chesapeake Bay TMDL and WIPs.

In addition, the individual permit has $cBOD_5$ limits of 5 and 8 mg/L and a minimum DO limit of 5.6 mg/L which provide protection of instream DO concentrations to at least 5.0 mg/L. However, implementation of the full Chesapeake Bay WIP, including GP reductions combined with actions proposed in other source sectors, is expected to adequately address ambient conditions such that the proposed effluent limits of this individual permit are consistent with the Chesapeake Bay TMDL, and will not cause an impairment or observed violation of the water quality standards for DO, chlorophyll a, or SAV.

See **Attachment 1** for the Richmond Crater Water Quality Management Plan and TMDL Fact Sheets.

14. **Antidegradation Review and Comments**: Tier 1 _X_ Tier 2 __ Tier 3 __

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect those uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream, James River, is determined to be a Tier 1 waterbody. The Richmond-Crater Water Quality Management Plan allocates $cBOD_5$ and ammonia to multiple dischargers in the segment for the purpose of limiting adverse effects to ambient dissolved oxygen and ammonia concentrations and to maintain a minimum dissolved oxygen concentration of 5.0 mg/L. As 5.0 mg/L was the water quality standard at the time the plan was developed, the river has been considered a Tier 1 water.

15. **Site Inspection**: Date: 06/25/2014 Performed by: Shawn Weimer

See 2014 Site Inspection Report in **Attachment 3**.

16. **Effluent Screening and Limitation Development**:

Conventional Parameters:

pH:

The Federal Effluent Guidelines (FEGs) for Secondary Treatment (40 CFR 133.102) and the Virginia Water Quality Standards (WQS), 9 VAC 25-260-50, effective January 6, 2011, require that pH be maintained between 6.0-9.0 SU. This is consistent with the limits set in the 2012 reissuance.

TSS:

The Federal Effluent Guidelines (FEGs) for Secondary Treatment (40 CFR 133.102) require that Total Suspended Solids (TSS) be limited to a monthly average of 30 mg/L. However, the 2012 permit contains a TSS limitation of 8 mg/L based on the $cBOD_5$ limit calculated from the Richmond Crater Water Quality Management Plan (See Table 1 below). This limit is carried forward to the 2017 reissuance in accordance with the antibacksliding regulation. Loading limits for TSS were calculated as follows:

Monthly Average: (8.0 mg/L)(75 MGD)(3.785 lbs/MG/mg/L) = 2300 kg/d

Weekly Average: (12 mg/L)(75 MGD)(3.785 lbs/MG/mg/L) = 3400 kg/d

Ammonia, $cBOD_5$, Dissolved Oxygen:

The Richmond Crater Water Quality Management Plan allocates load limitations of $cBOD_5$ and ammonia to multiple dischargers on this segment of the James River to limit the adverse effects to ambient dissolved oxygen concentrations and to maintain a minimum dissolved oxygen concentration of 5.6 mg/L. Henrico WRF (listed as Henrico STP in the Plan) was allocated wasteloads based on a design flow of 38.07 MGD when the plan was established. Since that time, the Henrico WRF has expanded to 75.0 MGD. While the wasteload allocations of $cBOD_5$ and ammonia remain unchanged, the expanded flow results in a change in concentration of these parameters. Table 1 below summarizes the wasteload allocations based on the Richmond Crater Water Quality Management Plan as well as the concentration limits based on the 75.0 MGD design flow.

Table 1. Ammonia, $cBOD_5$, and Dissolved Oxygen Calculations from 1989 Richmond Crater Interim Water Quality Management Plan

PARAMETER		MONTHLY			WEEKLY	
		lb/d [a]	kg/d	mg/L @75.0 MGD	kg/d	mg/L @75.0 MGD
$cBOD_5$	Summer	3002	1361	5 [c]	2044	7 [c]
	Winter	4756	2157	8 [c]	3236	11 [c]

NH_3 [b]	Summer	2403	1090	3.84	1635	5.76
	Winter	3504	1589	5.60	2385	8.40
DO	Summer	-	-	5.6	-	-
	Winter	-	-	5.6	-	-

[a] Wasteload allocations are from Richmond Crater Interim Water Quality Management Plan based on 38.07 MGD (**Attachment 1).**

[b] The Richmond Crater Interim Water Quality Management Plan lists the winter ammonia concentration limitation as a value with 3 significant digits and the summer concentration limitation in 2 significant digits. However, calculated concentration limitations are being expressed as three significant digits for summer and winter seasonal limitations in accordance with the Rules of Precision, the use of a design flow with three significant figures, and the chronic ammonia water quality standard.

[c] The $cBOD_5$ concentration limitations are expressed as one significant digit in accordance with GM06-2016 Amendment 1 which states "For BOD, the method is not accurate enough to provide data beyond a whole number."

Nutrients:

Technology based annual average concentration limits for total nitrogen (5.0 mg/L) and total phosphorus (0.5 mg/L) were included in the 2012 permit following the completion of a nutrient upgrade project and the issuance of a Certificate to Operate (CTO) on July 25, 2011. These technology based concentration limitations became effective on January 1, 2013. As there have been no changes to the nutrient control technology or design capacity of the facility since the 2011 upgrade, these limits are carried forward to the 2017 reissuance and are based on the installed technology. Compliance with these concentration limitations will ensure conformance with the annual total nitrogen and total phosphorus wasteload allocations as assigned in the Water Quality Management Planning Regulation (9 VAC 25-720-60.C) for the facility at a design capacity of 75.0 MGD without the need for offsets.

Bacteria:

All sewage discharges must be disinfected to achieve applicable bacterial concentrations in accordance with Virginia Water Quality Standards, 9 VAC 25-260-170. *E. coli* is the bacterial indicator for sewage effluents to freshwater. Further, the Henrico WRF was addressed in the bacterial TMDL for the James River and Tributaries – City of Richmond, which was approved by the EPA on 11/4/2010 and by the SWCB on 6/29/2012. The discharge received an annual *E. coli* wasteload allocation of 1.31E+14 cfu/year based on a design flow of 75.0 MGD. Compliance with the *E. coli* permit limitation of 126 n/100 mL (@75.0 MGD =1.31E+14 cfu/yr) will demonstrate compliance with the bacterial TMDL and Virginia Water Quality Standards.

Reasonable Potential Analysis:

A limitation evaluation begins by determining chronic and acute wasteload allocations (WLAs) using the MSTRANTI Excel Spreadsheet. MSTRANTI produces wasteload allocations using data inputs determined by the permit writer to be appropriate based on monitoring data. See **Attachment 4** for effluent data submitted in the permit application and Discharge Monitoring Reports (DMRs), explanation of MSTRANTI source data, MSTRANTI results, and STATS.exe results.

Because the discharge is to a tidal segment of the river, dilution ratios are used instead of stream flows. A memorandum dated June 22, 1999 from M. Dale Phillips documents the results of a CORMIX run for the discharge from Henrico County WRF (**Attachment 1**). Based on a design flow of 75 MGD, dilution ratios of 3:1 (acute) and 8:1 (chronic) were recommended. Senior planning staff indicated that these dilution ratios should be used to calculate permit limitations (**Attachment 1**).

If it is determined that a pollutant does or may exist in effluent, a Reasonable Potential Analysis must be conducted in order to determine if it is statistically probable that the effluent may cause or contribute to a violation of the instream acute and chronic criteria contained in the Virginia Water Quality Standards (9 VAC 25-260 et seq.). The first step of the analysis is determining the maximum concentration which will maintain the abovementioned criteria. This concentration is known as a wasteload allocation (WLA). The WLA is calculated in a DEQ spreadsheet called MSTRANTI, which calculates WLAs from receiving stream and effluent data for flow, water quality, and mixing during critical low flow conditions. The second step of the analysis requires inserting the acute and chronic WLAs and pollutant concentration data submitted by the permittee into another computer application called STATS. Based on the entered effluent data, STATS

calculates the daily, 4-day, and/or 30-day 97th percentiles from the lognormal distribution of the data and compares them to the WLAs. The 97th percentile value is used to determine if there is reasonable potential to cause water quality standards violations, and the appropriate limitation to prevent those violations, if necessary. This limitation is calculated by STATS based on EPA-guidelines for the control of toxic pollutants.

A summary of the Reasonable Potential Analysis is presented in Table 2. The limitations presented in Table 2 are those resulting from the Reasonable Potential Analysis and are not necessarily final or all-inclusive permit limitations.

Table 2. Reasonable Potential Analysis - 75.0 MGD

EFFLUENT PARAMETER	ACUTE WLA	CHRONIC WLA	HUMAN HEALTH WLA	ANALYSIS VALUE	LIMITATIONS	
					MONTHLY AVERAGE	WEEKLY AVERAGE
Ammonia (mg/L)	34.3	6.79	NA	9.0	6.79	8.37
Chloride (mg/L)	2600	1800	NA	72.1	NL	NL
Chlorine, Total Residual (TRC)	57	88	NA	20,000	28	35
Chloroform	NA	NA	88,000	64	NL	NL
Copper, dissolved	36	56	NA	0.66	NL	NL
Dichlorobromomethane	NA	NA	1,400	36.2	NL	NL
Nickel, dissolved	490	130	37,000	1.59	NL	NL
Tributyltin	1.4	0.58	NA	0.16	NL	NL
Zinc, dissolved	320	740	210,000	20.6	NL	NL

All values are in micrograms per liter (µg/L) unless otherwise indicated

NA = Not Applicable NL = No Limitation

Reasonable potential analyses for chloride, chloroform, copper, dichlorobromomethane, nickel, tributyltin, and zinc indicated that no limitations were necessary based off of the acute, chronic, or human health WLAs. See **Attachment 4** for STATS outputs for each parameter.

Ammonia:

A default data value of 9.00 mg/L is used in place of effluent data for ammonia in accordance with DEQ Guidance Memo No. 00-2011. Ammonia is known to be present in domestic effluents and thus a reasonable potential exists for any domestic facility to cause or contribute to a violation of the Virginia Water Quality Standards. Based on this analysis, the weekly and monthly average ammonia limitations necessary to protect ambient water quality of the receiving stream are 6.79 mg/L and 8.37 mg/L, respectively. These limitations are less stringent than the ammonia concentrations calculated using the allocations in the Richmond Crater Water Quality Management Plan. Therefore, the limitations from the Plan in Table 1 above will be carried forward for the 2017 reissuance in accordance with planning documents and agency antibacksliding policy.

Total Residual Chlorine:

In accordance with DEQ Guidance Memo No. 00-2011, a default value of 20,000 µg/L is used in place of effluent data for total residual chlorine (TRC) when the method of disinfection used is chlorination. The evaluation indicated the need for TRC limitations of 28 µg/L (monthly) and 35 µg/L (weekly). These are consistent with the limitations for TRC established in previously issued permits are carried forward to the 2017 reissuance.

Dissolved Sulfide:

The permittee reported the presence of hydrogen sulfide in the effluent at a concentration of 492 µg/L in the 2012 permit reissuance application. Analysis of the data in STATS.exe indicated that a limitation for hydrogen sulfide was necessary to protect water quality. Through a conversion method, the data were initially used to attempt to assess potential hydrogen sulfide levels in the effluent. However, the accuracy and precision of using total sulfide results for developing limitations for hydrogen sulfide has recently come under question. According to Standard Methods, the unionized H_2S "can be calculated from the concentration of dissolved sulfide, the sample pH, and the conditional ionization constant of H_2S." Based on the above, it appeared to be more appropriate to specify that results be reported as dissolved sulfide. To provide data to evaluate the potential presence of H_2S and need for a limit, dissolved sulfide monitoring was required once per six months by grab sample for the 2012 permit term.

DMR data from the 2012 permit term did not show any detections of dissolved sulfides above the quantification level (QL) of 0.10 mg/L specified in the 2012 permit. Further, hydrogen sulfide was not indicated as present on the Water Quality Criteria Monitoring Form in the 2017 permit application. For these reasons, the monitoring requirements for dissolved sulfide are being removed in the 2017 reissuance based on Professional Judgment.

Table 3. Effluent Limitations and Monitoring Requirements

PARAMETER		BASIS	DISCHARGE LIMITS					
			MONTHLY AVERAGE		WEEKLY AVERAGE		MIN	MAX
001 Flow (MGD)		NA	NL – monitoring only				NA	NL
002 pH (standard units)		1	NA		NA		6.0 S.U.	9.0 S.U.
004 Total Suspended Solids (TSS)		2	8.0 mg/L	2300 kg/d	12 mg/L	3400 kg/d	NA	NA
005 Total Residual Chlorine (TRC)		3	28 µg/L		35 µg/L		NA	NA
007 Dissolved Oxygen		4	NA		NA		5.6 mg/L	NA
012 Total Phosphorus – Annual Average		5	0.50 mg/L		NA		NA	NA
013 Total Nitrogen – Annual Average		5	5.0 mg/L		NA		NA	NA
Ammonia as N	318 June – October	4	3.84 mg/L	1090 kg/d	5.76 mg/L	1635 kg/d	NA	NA
	069 November – May	4	5.60 mg/L	1589 kg/d	8.40 mg/L	2385 kg/d	NA	NA
$cBOD_5$	315 June – October	4	5 mg/L	1361 kg/d	7 mg/L	2044 kg/d	NA	NA
	073 November – May	4	8 mg/L	2157 kg/d	11 mg/L	3236 kg/d	NA	NA
120 *E.coli*		1	126 N/100 mL (geometric mean)		NA		NA	NA
157 TRC Contact*		2	NA		NA		1.0 mg/L	NA
213 TRC Contact*		2	NA		NA		0.60 mg/L	NA
805 Total Nitrogen (as N) – Year to Date		5	NL – monitoring only				NA	NA
806 Total Phosphorus (as P) – Year to Date		5	NL – monitoring only				NA	NA

1. Water Quality Standards (9 VAC 25-260)
2. Professional Judgement
3. Water Quality Based Effluent Limitation
4. Richmond Crater Water Quality Management Plan
5. Nutrient Regulations and DEQ Related Guidance

* Samples are taken prior to dechlorination.

17. **Basis for Sludge Use & Disposal Requirements:** Henrico County contracts with Nutri-Blend, Inc. to land apply the sludge generated by the facility. The sludge meets Class B pathogen reduction. Applicable sludge requirements are addressed by the facilities that receive the sludge.

18. **Antibacksliding:** All limitations are at least as stringent as contained in the 2012 permit.

19. **Compliance Schedules:** Compliance schedules are not applicable to the permit reissuance.

20. **Special Conditions**

I.B Additional TRC Limitations and Monitoring Requirements

Rationale: Required by Sewage Collection and Treatment Regulations, 9 VAC 25-790, and Virginia Water Quality Standards 9 VAC 25-260-170, Bacteria; Recreational waters. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This ensures proper operation of chlorination equipment to maintain adequate disinfection.

I.C.1 95% Capacity Reopener

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B.4 for all POTW and PVOTW permits.

I.C.2 Indirect Dischargers

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 1 and B 2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

I.C.3 Operations and Maintenance Manual Requirement

Rationale: Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790; VPDES Permit Regulation, 9 VAC 25-31-190 E.

I.C.4 Licensed Operator Requirement

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 C and the Code of Virginia § 54.1-2300 et seq., Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.), require licensure of operators.

I.C.5 Reliability Class

Rationale: Required by Sewage Collection and Treatment Regulations, 9 VAC 25-790 for all municipal facilities.

I.C.6 Compliance Reporting

Rationale: Authorized by VPDES Permit Regulation, 9 VAC 25-31-190 J 4 and 220 I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limitation or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

I.C.7 Materials Handling/Storage

Rationale: 9 VAC 25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and 62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

I.C.8 CTC, CTO Requirement

Rationale: Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790. 9 VAC 25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade.

I.C.9 Reopeners

Rationale:

a. Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed it they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.

b. 9 VAC 25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade.

c. 9 VAC 25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

I.C.10 Closure Plan

Rationale: This condition establishes the requirement to submit a closure plan for the treatment works if the treatment facility is being replaced or is expected to close. This is necessary to ensure treatment works are properly closed so that the risk of untreated waste water discharge, spills, leaks and exposure to raw materials is eliminated and water quality maintained. Section 62.1-44.21 requires every owner to furnish when requested plans, specification, and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purpose of the State Water Control Law.

I.C.11 Nutrient Reporting Calculations

Rationale: §62.1-44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this definition is carried forward in 9 VAC 25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, this special condition is intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.

I.C.12 Suspension of Annual Average Concentration Limitations for E3/E4 Facilities

Rationale: 9 VAC 25-40-70 B authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.

I.D Pretreatment Program

Rationale: VPDES Permit Regulation, 9 VAC 25-31-730 through 900, and 40 CFR Part 403 require certain existing and new sources of pollution to meet specified regulations.

I.E Whole Effluent Toxicity (WET) Monitoring Program

Rationale: VPDES Permit Regulation, 9 VAC 25-31-210 and 220 I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. See **Attachment 5** for the WET Testing Evaluation.

II.A-Z Conditions Applicable to All VPDES Permits

Rationale: The VPDES Permit Regulation at 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

III.B.1 Approved Sources of Biosolids

Rationale: 9 VAC 25-32-440.D states "No person shall land apply, market, or distribute biosolids in Virginia unless the biosolids source has been approved by the board." 9 VAC 25-32-510 B and C require sewage sludge to be treated to meet biosolids standards prior to delivery to the land application site.

III.B.2 Biosolids Monitoring Frequency and Reporting Requirements

Rationale: Table 1 of 9 VAC 25-31-570.A specifies the minimum sample frequency based on amount of biosolids generated that are land applied in bulk or prepared for sale or give-away in a bag or other container. 9 VAC 25-31-570.A allows monitoring frequency to be reduced after 2 years of monitoring. 9 VAC 25-31-590.A requires the submittal of an annual report postmarked by February 19 for the previous year. 9 VAC 25-31-220.I.3 provides for the VPDES permit to require monitoring the volume of biosolids and other measurements as appropriate. 9 VAC 25-31-590.C requires reports be maintained verifying that sludge treatment for pathogen and vector attraction reduction be maintained by the generator and owner (of the permit). 9 VAC 25-31-190.H requires the permittee to submit information requested by the board, within a reasonable time, to determine compliance with the permit. Other specific information and maintenance requirements are identified in 9 VAC 25-20-147.A.

III.B.3 Record Keeping

Rationale: VPDES Permit regulation 9 VAC 25-31-580 outlines record keeping requirements for biosolids. 9 VAC 25-31-190.J requires all records pertaining to biosolids to be maintained for 5 years, including monitoring information, copies of all reports required by the permit and data used to develop the permit application.

III.B.4 Notice and Necessary Information (NANI)

Rationale: 9 VAC 25-31-530.F requires the generator of biosolids who provides biosolids to a land applier, to give notice and necessary information to the land applier. 9 VAC 25-31-480 states that the preparer of biosolids shall ensure that the applicable requirements in 9 VAC 25-31 Part VI are met when biosolids are land applied. 9 VAC 25-31-530.F requires that when the preparer of biosolids gives his biosolids to another person who prepares biosolids, the person who provides the biosolids give the person who receives the biosolids notice and necessary information to comply with 9 VAC 25-31 Part VI.

III.B.5 Biosolids Management Plan (BSMP)

Rationale: VPDES Permit Regulation 9 VAC 25-31-485.G requires the permit holder to maintain and implement a BSMP and specifies its components. In addition to all materials submitted with permit application, which includes an Odor Control Plan (OCP), a Nutrient Management Plan (NMP) and Operation and Maintenance (O&M) Manual are required. 9 VAC 25-31-485.G.3, 9 VAC 25-790-140 and 9 VAC 25-790-260 through 300 identify minimum requirements to be included in an O&M Manual. Additional requirements are included in the BSMP 9 VAC 25-31-100.Q.12. 9 VAC 25-31-100.Q.6. requires Generator's OCP and minimum content.

III.B.6 Biosolids/Sludge Reopener

Rationale: 9VAC25-31-220.C requires inclusion of a reopener clause in the permit to authorize immediate modification of the permit to address changes to standards or requirements for the use or disposal of biosolids, industrial wastewater sludge, or septage.

21. **Changes to 2012 Permit**

Cover Page	
Changes	**Rationale**
Dates	Effective and Expiration Dates updated to reflect new permit term
Signatory	Updated title of signatory

Part I.A.1					
Parameter Changed	**Effluent Limits Changed**		**Monitoring Requirement Changed**		**Rationale**
	From	**To**	**From**	**To**	
All	Parameter codes were added for each parameter and were put in numerical order.				For consistency between the Permit, Fact Sheet, and Discharge Monitoring Reports.
Total Phosphorus – Monthly Average	2.0 mg/L	-	1 per Day	-	Limit no longer in effect as of December 31, 2012, per the 2012 permit. Associated footnotes (10 and 11) removed.
Dissolved Sulfide	NL	-	1 per 6 Months	-	Removed in accordance with the rationale provided in Section 16. Associated footnote (8) removed.

Part I.A.2
All biosolids limitations and monitoring requirements and management and reporting requirements moved to Part III of the Permit with expanded language in accordance with: 9 VAC 25-31-420 through 720 and 9 VAC 25-32-303 through 358.

Part I Special Conditions			
Special Condition Changed			**Changes and Rationale**
From	To	Condition Title	
-	-	All Special Conditions	The language of all Special Conditions was updated in accordance with 2014 VPDES Permit Manual (GM14-2003).
I.B.3	I.B.3	Additional TRC Limitations and Monitoring Requirements	Language added in response to Owner Comments on the draft permit. See **Attachment 9** for Owner Review and DEQ Response.
I.C.6	-	Sludge Use and Disposal	Incorporated into Part III.B.6 with expanded language. See rationale in Section 20 above.
I.C.7	-	Sludge Reopener	Moved to Part III.B.6. See rationale in Section 20 above.
I.C.8	I.C.6	Compliance Reporting	Renumbered. The quantification level (QL) for dissolved sulfide was removed in accordance with the removal of dissolved sulfide monitoring per Section 16 above.
I.C.9	I.C.7	Materials Handling /Storage	Renumbered. The language of this Special Condition was significantly condensed per GM14-2003.
I.C.10	I.C.8	CTC, CTO Requirement	Renumbered.
I.C.11	I.C.9	Reopeners	Renumbered.
I.C.12	I.C.10	Closure Plan	Renumbered.
I.C.13	I.C.11	Nutrient Reporting Calculations	Renumbered.

I.C.14	I.C.12	Suspension of Annual Average Concentration Limitations for E3/E4 Facilities	Renumbered.
I.D.11	I.D.11	Pretreatment Program	The 2012 permit changed the industrial user survey due date in part I.D.11 from "180 days after the effective date of the permit" to "one year after the effective date of the permit" per the permittee's request and CO approval. The permittee's request during the 2012 reissuance was based on the their concerns that additional time would be needed to complete the survey due to a transition period related to newly implemented software integral to the management of the program. As the facility is no longer in this transition period, the boilerplate language of 180 days from the updated VPDES Permit (GM14-2003) has been applied.
I.E	I.E	Whole Effluent Toxicity (WET) Monitoring Program	Revised based on consultation with D. Debiasi (CO) after analysis of previous WET monitoring results. See **Attachment 5** for WET Testing Evaluation.
I.F	I.F	Record Keeping Special Conditions for Land Application of Sewage Sludge	Incorporated into Part III.B.3 with expanded language. See rationale in Section 20 above.
I.G	I.G	Reporting Land Application of Sewage Sludge	Incorporated into Part III.B.2 with expanded language. See rationale in Section 20 above.

Part II – Conditions Applicable to All VPDES Permits
Updated in accordance with GM14-2003

Part III - Biosolids
Added to incorporate all biosolids limitations and monitoring requirements and management and reporting requirements with expanded language in accordance with: 9 VAC 25-31-420 through 720 and 9 VAC 25-32-303 through 358. See further rationale in Section 20 above.

22. **Variances/Alternate Limits or Conditions**: None

23. **Regulation of Users 9 VAC 25-31-280 B.9**: Not Applicable because this treatment works is owned by the Commonwealth of Virginia.

24. **Public Notice Information required by 9 VAC 25-31-280 B**:

    All pertinent information is on file and may be inspected or copied by contacting

    Mr. Joseph Bryan
    Virginia DEQ - Piedmont Regional Office
    4949-A Cox Road
    Glen Allen, Virginia 23060-6296
    Telephone Number: 804-527-5012
    Facsimile Number: 804-527-5106
    Email: joseph.bryan@deq.virginia.gov

    DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason

why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit. The public may review the draft permit and application at the DEQ Piedmont Regional Office by appointment or may request copies of the documents from the contact person listed above.

Public Notice Requirements: The legal ad announcing the public comment period was run in the *Richmond Times-Dispatch* on April 24, 2017 and May 1, 2017. The comment period began on April 24, 2017 and ended at 11:59 pm on May 24, 2017.

25. Additional Comments:

a. Previous Board Action:

(1) A Consent Order was issued December 17, 2010, to address permit violations caused by overloading of the plant due to inflow and infiltration. The Consent Order included requirements for developing a standard operation procedure manual for the plant as well as a compliance schedule for collection system rehabilitation projects to reduce inflow and infiltration.

b. Staff Comments:

(1) Planning conformance statement: The discharge is in conformance with the existing planning documents for the area.

(2) Controversial Permit Assessment: This permit is not expected to be controversial.

(3) Fees: Permit maintenance fees are up to date, last paid on 09/13/2016.

(4) e-DMR Participation: The facility participates in the e-DMR program as of 06/03/2009.

(5) Virginia Environmental Excellence Program (VEEP) Participation: The facility is not enrolled in the VEEP program.

(6) Effluent Monitoring Reductions: This facility is not eligible for reduced monitoring because the facility is operating under a consent order. See Section 25.a above.

(7) General Permit Registration:

Nutrient GP: VAN040081

Industrial Stormwater GP: VAR051633

(8) Financial Assurance: Financial assurance does not apply to this facility because it is a publicly owned treatment works.

(9) Permit Expiration Date: The expiration date is set to occur at the end of the month in order to begin each future permit cycle at the start of a monitoring period.

c. Other Agency Comments

(1) EPA comments: The draft permit was forwarded for EPA review on 04/24/2017 because the facility is classified as major and discharges to a receiving stream listed on the 303(d) list.

(2) VDH-ODW comments:

VDH Office of Drinking Water (ODW) reviewed the reissuance application. In a letter dated 03/20/2017, VDH-ODW stated that the nearest downstream raw water intake (Virginia-American-Hopewell WTP) is located approximately 18 miles from the discharge point. For flow passing through the Jones Neck Cutoff and the Turkey Island Cutoff on the James River, the downstream distance to the raw water intake is decreased to 9 miles. No wells for permitted waterworks were found within a one-mile radius from the discharge. See **Attachment 6**.

(3) VDH-DSS comments:

VDH Division of Shellfish Sanitation (DSS) reviewed the reissuance application. In an email dated 03/08/2017, VDH-DSS stated that the discharge will not affect shellfish growing waters. See **Attachment 6**.

(4) DCR-DNH comments:

DCR Division of Natural Heritage (DNH) reviewed the reissuance application (**Attachment 7**). In a letter dated 03/14/2017, DCR recommended the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations in order to minimize adverse impacts to the aquatic ecosystem. DCR also supports the use of UV/Ozone to replace chlorination disinfection and the utilization of new technologies as they become available to improve water quality. Further, DCR recommended coordination with DGIF and USFWS based on the legal status of the Atlantic sturgeon to ensure compliance with the Virginia Endangered Species Act.

Staff Response:

This facility has registered under the Industrial Stormwater General Permit (VAR051633) which addresses compliance with state and local erosion and sediment control and stormwater management laws and regulations for this facility.

The treatment plant will utilize chlorination as a means of disinfection followed by dechlorination. Limits which are protective of the in-stream standard have been included in the permit. However, the quantification level must remain at 0.10 mg/l. DEQ does not specify the type of treatment needed but reviews applications and incorporates limits into permits which are protective of water quality.

DGIF and the USFWS did not request coordination on this permit reissuance. However, DEQ believes that effluent limits from this facility meet the requirements of the Water Quality Standards and the VPDES permit regulation and does not violate either the Federal Endangered Species Act or the Virginia Endangered Species Act.

(5) DGIF: The Department of Game and Inland Fisheries did not request coordination on this permit reissuance.

(6) USFWS: The US Fish and Wildlife Service did not request coordination on this permit reissuance.

d. Owner Comments: See **Attachment 9** for Owner Comments and DEQ Response.

e. Public Notice comments: **TBD**

f. Local Government Notification of Public Notice: Local government officials were notified of the public comment period on 04/24/2017. In accordance with the Code of Virginia §62.1-44.15:01, the following individuals received the notification: the Henrico County Administrator, the Chairman of the Board of Supervisors, and the Richmond Regional Planning District Commission.

26. Summary of attachments to this Fact Sheet:

Attachment 1	Planning Documents and Ambient Data (Flow Frequency Analysis, 2014 TMDL Fact Sheets, Ambient Water Quality Data, 1999 CORMIX Model, 1989 Richmond Crater Water Quality Management Plan)
Attachment 2	Facility Information (Location Maps, Process Flow Diagrams, Materials Storage)
Attachment 3	2014 Site Inspection Report
Attachment 4	Effluent Data Summary and Evaluation (MSTRANTI Source Table, DMR and Application Data, MSTRANTI, STATS.exe results)
Attachment 5	Whole Effluent Toxicity (WET) Testing Evaluation (WET Memorandum, Approval)
Attachment 6	VDH Coordination (VDH-ODW, VDH-DSS)
Attachment 7	Threatened and Endangered Species Coordination (DCR-DNH)
Attachment 8	EPA Comments and DEQ Response
Attachment 9	Owner Comments and DEQ Response
Attachment 10	Public Comments and DEQ Response